NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

RIPARIAN FOREST BUFFER

(acre)
CODE 391

DEFINITION

An area of predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.

PURPOSE

- Create shade to lower water temperatures to improve habitat for aquatic organisms.
- Provide a source of detritus and large woody debris for aquatic and terrestrial organisms.
- Create wildlife habitat and establish wildlife corridors.
- Reduce excess amounts of sediment, organic material, nutrients and pesticides in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow.
- Provide a harvestable crop of timber, fiber, forage, fruit, or other crops consistent with other intended purposes.
- Provide protection against scour erosion within the floodplain.
- Restore natural riparian plant communities.
- To increase carbon storage.

CONDITIONS WHERE PRACTICE APPLIES

On areas adjacent to permanent or intermittent streams, lakes, ponds, wetlands and areas with ground water recharge that are capable of supporting woody vegetation.

CRITERIA

General Criteria Applicable to All the Purposes Stated Above

The location, layout and density of the riparian forest buffer will accomplish the intended purpose and function.

Dominant vegetation will consist of existing, naturally regenerated, or planted trees and shrubs suited to the site and the intended purpose.

All buffers will consist of a Zone 1 that begins at the normal water line, or at the top of the bank, and extends a minimum distance of 15 feet, measured horizontally on a line perpendicular to the water body.

Occasional removal of some tree and shrub products such as high value trees is permitted in zone 1 provided the intended purpose is not compromised by the loss of vegetation or harvesting disturbance.

Necessary site preparation and planting shall be done at a time and manner to insure survival and growth of selected species.

Only viable, high-quality and adapted planting stock will be used.

Site preparation shall be sufficient for establishment and growth of selected species and is done in a manner that does not compromise the intended purpose.

Livestock shall be controlled or excluded as necessary to achieve and maintain the intended purpose.

Harmful pests present on the site will be controlled or eliminated as necessary to achieve and maintain the intended purpose.

For optimal carbon storage, select plant species that are adapted to the site to assure strong health and vigor and plant the full stocking rate for the site.

Comply with applicable federal, state and local laws and regulations during the installation, operation (including harvesting activities) and maintenance of this practice.

Additional Criteria To Reduce Excess Amounts of Sediment, Organic Material, Nutrients and Pesticides in Surface Runoff and Reduce Excess Nutrients and Other Chemicals in Shallow Ground Water Flow

An additional strip or area of land, Zone 2, will begin at the edge and up-gradient of Zone 1 and extend a minimum distance of 20 feet, measured horizontally on a line perpendicular to the water body. The minimum combined width of Zones 1 and 2 will be 100 feet or 30 percent of the flood plain whichever is less, but not less than 35 feet.

Criteria for Zone 1 shall apply to Zone 2 except that removal of products such as timber, fiber*,* nuts, fruit and forbs is permitted and encouraged on a periodic and regular basis provided the intended purpose is not compromised by loss of vegetation or harvesting disturbance.

Zone 2 will be expanded in high nutrient, sediment, and animal waste application areas, where the contributing area is not adequately treated or where an additional level of protection is desired.

A Zone 3 shall be added to the riparian buffer when adjacent to cropland or other sparsely vegetated or highly erosive areas to filter sediment, address concentrated flow erosion, and maintain sheet flow. The Filter Strip standard (practice code 393) shall be used to design Zone 3.

Additional Criteria To Provide Habitat For Aquatic Organisms And Terrestrial Wildlife

Width of Zone 1 and/or Zone 2 will be expanded to meet the minimum requirements of the wildlife or aquatic species and associated communities of concern.

Establish plant communities that address the target wildlife needs and existing resources in the watershed.

CONSIDERATIONS

The severity of bank erosion, concentrated flow erosion or mass soil movement and its influence on existing or potential riparian trees and shrubs should be assessed. Watershed-level or contributing area treatment or bank stability activities may be needed before establishing a riparian forest buffer.

When concentrated flow erosion and sedimentation cannot be controlled vegetatively, consider structural or mechanical treatments.

Favor tree and shrub species that are native*,* non-invasive, or have multiple values such as those suited for timber, biomass, nuts, fruit, browse, nesting, aesthetics and tolerance to locally used herbicides.

Tree and shrub species, which may be alternate hosts to undesirable pests, should be avoided. Species diversity should be considered to avoid loss of function due to species-specific pests.

Plants that deplete ground water should be used with caution in water-deficit areas.

Allelopathic impacts of plants should be considered.

The location, layout and density of the buffer should complement natural features, and mimic natural riparian forests.

PRACTICE EFFECTS

Refer to Section V of the FOTG for additional Conservation Practice Physical Effects information.

Soil

A long-term effect of planting a woody vegetative buffer will be a decrease in soil erosion. There may be an increase initially depending on site preparation and maintenance during the establishment period. Soil tilth and compaction should improve within the buffer because of development of root mass and increased organic material.

Water

After establishment there will be reduced runoff and increased infiltration, depending on plant spacing. The buffer can spread surface runoff entering as overland flow. One primary function of the buffer will be to remove, sequester, or transform nutrients (such as nitrate), sediment, and other pollutants. A woody vegetative buffer can also decrease water temperature of the stream. During planting there may be a temporary increase in runoff and sedimentation due to ground disturbance/planting.

Air

Air quality should improve due to decreased airborne sediments, if "before" condition was bare. There may be an increase of air particulates during establishment. Humidity and localized rainfall within the buffer may increase due to increased transpiration.

Plant

Plant suitability will improve because of proper selection of adaptive tree and shrub species.

Animal

Two primary sources of food energy input to streams are litterfall from streamside vegetation and algal production within the stream. New or additional tree canopy within the buffer will influence litter input and primary productivity of algae in the stream. Tree shading will also enhance habitat by lowering stream temperature. Selection of suitable woody vegetation will overall improve cover, food availability, and habitat for fish and wildlife.

PLANS AND SPECIFICATIONS

Site-specific specifications which document the requirements for installing, operating and maintaining the practice on a particular site to achieve its intended purpose(s) will be prepared in accordance with this standard and the practice specification.

The specifications shall be developed based on an inventory of current conditions including: stream hydraulics and other site conditions, and a design criteria that considers adapted plants and their erosion control characteristics, the hydraulic limitations of revegetation, desired fish and wildlife habitat, and suitable methods of installation and maintenance.

The specifications shall include the following information: planned buffer width for each zone to be planted, species to be

planted, plant spacing, kind of stock to be planted, planting dates, site preparation, planting requirements, and operation and maintenance requirements.

The site-specific specifications shall be documented on the NRCS Hawaii Jobsheet for this practice and given to the client. Other documents such as worksheets, maps, drawings, and narrative statements in the conservation plan may be used to plan and design the practice and to prepare the site-specific specifications.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life.

The riparian forest buffer will be inspected periodically and protected from adverse impacts such as excessive vehicular and pedestrian traffic, pest infestations, pesticides, livestock or wildlife damage and fire.

Replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the buffer is, or will progress to, a fully functional condition.

As applicable, control of concentrated flow erosion and sediment deposition shall be controlled by an adjacent filter strip.

Any use of fertilizers, pesticides and other chemicals to assure buffer function shall not compromise the intended purpose.